

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1-20 are requested to be cancelled.

Claims 21-43 are being added.

This amendment adds and deletes claims in this application. No new matter has been added to the application via the new claims, each of which is described and enabled by the originally filed disclosure. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

The Examiner has rejected all of the pending claims. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Hall 5,993,993 as evidenced by Smith et al. 6,245,461. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of French et al. 2002/0160271. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Abraham et al 4,489,145. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Chen et al. 20030157413. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall

5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Denton, III 5,962,168. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Kubota et al. 5,654,114. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Sato et al. 2004/0001302. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of the Japanese publication JP 10-040928. Claim 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Chen et al. 20030157413. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Abraham et al. 4,489,145 in combination with Denton, III 5,962,168. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949 in combination with Kubota et al. 5,654,114. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Japanese publication JP 10-270082 (heretofore the JP' 082). Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Japanese publication JP 10-040928 (heretofore the JP' 928). Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949 in combination with Denton, III 5,962,168. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Denton, III 5,962,168. Lastly, Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable

over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Sato et al. 2004/0001302 in combination with Yano et al. 6,507,378.

Applicants have canceled all of the rejected claims. New independent claims 21, 35, and 40 have been added. Claim 21 is directed to a lithium based electrochemical cell. Claims 35 and 40 are directed to secondary cells. Applicants wish to thank the Examiner for his thorough analysis of the prior art. As such, although the rejected claims have been canceled, Applicants will address each of the Examiner's rejections in an attempt to further prosecution of the newly added claims. For ease of examination, Applications respectfully note that the compounds formerly recited in dependent claims are also recited in the newly added dependant claims. The Examiner may find the following summary useful in reviewing the newly added claims in light of the prior art and Applicants arguments: newly added claims 22, 37 and 41 relate to the element of original claim 6. Newly added claims 23, 38 and 42 relate to the element of original claim 7. Newly added claims 24, 39 and 43 relate to the element of original claim 8. Newly added claim 25 relates to the element of original claim 10. Newly added claim 26, relates to the element of original claim 11. Newly added claim 27, relates to the element of original claim 12. Newly added claim 28, relates to the element of original claim 13. Newly added claim 29, relates to the element of original claim 14. Newly added claim 30, relates to the element of original claim 15. Newly added claim 31, relates to the element of original claim 16. Newly added claim 32, relates to the element of original claim 17. Newly added claim 33, relates to the element of original claim 18. Newly added claim 34, relates to the element of original claim 20. Newly added claim 36, relates to the element of original claim 2.

With regard to the rejection of Claim 5 under 35 U.S.C. 112, second paragraph, as being indefinite, Applicants have canceled claim 5 and respectfully submit that the rejection is now moot. As such, Applicants also note that the objected to language is not present in any of the newly added claims.

Turning to the rejections over the cited prior art, Applicants will address each rejection in turn. The Examiner has relied on Hall as the primary reference for each rejection in the Office

action. Regarding the rejection of Claims 1-3 under 35 U.S.C. 102(b) as being anticipated by Hall as evidenced by Smith et al., Applicants respectfully note that Hall even as evidenced by Smith fails to teach all of the limitations of Claim 1. Specifically, the newly added independent claims 21, 35, and 40 all require a degassing agent. Claim 21 further requires that the electrolyte comprise a certain component consisting of a lithium salt, a first aprotic solvent and a second aprotic solvent, a component consisting of a liquid gel and a lithium salt dissolved therein, or a component consisting of a solid polymer and a lithium salt dissolved therein and a degassing agent. The claims then make clear that the electrolyte includes one of the selected components and the degassing agent.

Regarding the rejection of claim 2, while Applicants understand the Examiner's citation to the background of Smith to support the Examiner's inherency argument regarding the use of an electrolyte, Applicants respectfully believe the Examiner citation to specific teachings of Smith is inappropriate for a §102 rejections. Claims \_ require each of the two aprotic solvents to be selected from the group consisting of ethylene carbonate, dimethyl carbonate, ethyl methyl carbonate, propylene carbonate, and diethyl carbonate. The citation to the detailed description of Smith does not support an argument that Hall inherently teaches the specific organic solvents formerly described in claim 2 (now claim 36). Rather, Smith teaches only the use of the cited organic liquids. Smith refers a "preferred embodiment" as using certain organic liquids, with no mention or teaching indicating that such liquids were known in the art. Thus, Smith does not evidence that Hall enables the claimed organics, nor teaches or even suggests that a term of Hall has a meaning understood to indicate the presence of those organics, nor establish that the organics are inherently disclosed by the teachings of Hall. Even if Smith evidences that the structure of Hall would inherently include an electrolyte, Smith does not indicate that Hall fairly or reasonably teaches or even suggests the specific components of the electrolyte as claimed in claim 36. Thus, Applicants respectfully request that the claims be allowed.

In addition, the language of claims 35 and 36 (and original claim 2) require two different aprotic solvents, whereas the cited reference in Smith only teaches a singular solvent. Therefore,

even a rejection of the claim as obvious over the combination of Smith and Hall would not be fairly based. Specifically, the cited passage of Smith states, “an organic liquid which includes propylene carbonate, ethylene carbonate, dimethyl carbonate, or sulfonate...” Smith, Col. 5, lns 50-51 (emphasis added). Smith clearly indicates “or” not “and” or “and combinations thereof”.

Applicants will now turn to the rejections of claims 4-20 under §103 as obvious over Hall in light of various references. Applicants now turn to the rejection of claims 6-8 and 10. Applicants respectfully disagree with the rejection of Claims 8 under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949. Claims 24, 39 and 43 add the limitation that the “degassing agent comprises a compound or a blend of compounds having a formula selected from the group consisting of  $R_2-C=R_1=CH_2$ ,  $R_2-C\equiv R_1\equiv CH$ ,  $R_2-CH=R_1$  and  $R_2-C\equiv R_1$ , wherein  $R_1$  is an aliphatic carbon chain of 1 to 7 carbons and wherein  $R_2$  is a compound selected from the group consisting of an aromatic, a cyclic hydrocarbon, an aromatic hydrocarbon, a pyrrole, a piperazine, and a piperidine.” As the Examiner notes, neither Smith nor Hall disclose the claimed degassing agents. However, Besenhard also fails to disclose any of the claimed compounds. Besenhard does disclose 1,5-hexadiene, cyclohexene, and 4-vinylcyclohexene. However, none of Besenhard’s disclosed compounds fall within the classes of compounds defined in claims 22-24, 37-39 and 41-43. Therefore, Applications request that the Examiner allow these claims.

Applicants also respectfully disagree with the rejection of claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Abraham et al 4,489,145. Abraham discloses the use of 5 or 6 membered heterocycles and “certain acyclic analogs.” Abraham specifically discloses, and the Examiner has cited to, 2,4-dimethyl-1,3-pentadiene, V. Claim \_ requires having the structure  $CH_2=R_1=CH_2$ , wherein  $R_1$  is an aliphatic carbon chain of 1 to 7 carbons. Abraham fails to teach terminal carbons having hydrogens and a C-C double bond..

Claim 8, 39 and 43 requires the “degassing agent comprises a compound or a blend of compounds having a formula selected from the group consisting of  $R_2-C=R_1=CH_2$ ,  $R_2-C\equiv R_1=CH$ ,  $R_2-CH=R_1$  and  $R_2-C\equiv R_1$ , wherein  $R_1$  is an aliphatic carbon chain of 1 to 7 carbons and wherein  $R_2$  is a compound selected from the group consisting of an aromatic, a cyclic hydrocarbon, an aromatic hydrocarbon, a pyrrole, a piperazine, and a piperidine.” Abrahams does not teach or even suggest the groups as claimed for  $R_2$ . The groups of  $R_2$  are cyclic whereas the R groups of Abrahams are acyclic.

Claim 25 requires “a compound selected from the group consisting of 2,3 dimethyl-1,3 butadiene, 1,3 butadiene, 2,3 dimethyl-1,4 pentadiene, and 1,5 hexadiene.” Abrahams fails to teach or even suggest any of these specific compounds for use as a degassing agent. Therefore, Applications request that the Examiner allow claims 25.

Applicants further respectfully disagree with the rejection of claims 6-8 and 10 under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601. The Examiner has relied on Lucas for disclosing 2,3 dimethyl-1,3 butadiene. However, Applicants respectfully note that Lucas, while disclosing the claimed of 2,3 dimethyl-1,3 butadiene, teaches its use as a monomer “that can be used for simultaneous polymerization [of tetrahydrofuran] at the cathode....” Lucas does not fairly or reasonably teach the formation of a battery, but rather the use of an electrolytic process for polymer synthesis. Lucas actually teaches away from the use of the of 2,3 dimethyl-1,3 butadiene as component of the electrolyte, instead specifically teaching its use as a degassing agent. Lucas requires the use of monomers for the described polymer synthesis. Thus use of a monomer, which is capable of polymerizing, as the electrolyte for the solution would render control of the reaction difficult at best, as well as resulting in a widely inconsistent amount of degassing agent over the operation of the cell. The cited combination contains no teachings regarding the claimed classes of degassing agents. Therefore, Applications request that the Examiner allow claims 22-24, 37-39, 41-43.

Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Chen et al. 20030157413. Claims 26 substantially include the limitation of claims 11, and claims 32 substantially include the limitations of claim 17. Claim 26 requires “the degassing agent comprises a blend of 2,3 dimethyl-1,3 butadiene and vinyl ethylene carbonate.” Claim 32 require “the degassing agent comprises a blend of 2,3 dimethyl-1,3 butadiene and triphenyl phosphate.” The Examiner has relied on Lucas for disclosing 2,3 dimethyl-1,3 butadiene and Chen for disclosing vinyl ethylene carbonate and triphenyl phosphate. For the same reasons stated above, Applicants respectfully submit that Lucas fails to teach the use of the claimed compound in an electrolyte for use as a degassing agent. Lucas teaches instead the use of an electrolyte for polymer synthesis, wherein the claimed compound is the monomer for the synthesis.

In addition, the claims require a blend of 2,3 dimethyl-1,3 butadiene with vinyl ethylene carbonate (claims 2-6) and triphenyle phosphate (claim 32). The Examiner has cited no references that teach or even suggest such a blend or which provide any motivation or fairly based reason to produce such a blend. In fact, Chen, while cited as teaching vinyl carbonate and triphenyl phosphate, rather teaches a blend of those two compounds with a propylene carbonate. The rejection amounts to requiring four pieces of prior art, modifying one of them to select only a single compound from its described blend and then to blend, without motivation, that compound with another compound taught as a monomer for polymer synthesis. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Abraham et al. 4,489,145 in combination with Denton, III 5,962,168. Claim 27 relates to the limitations of claim 12 and require that “the degassing agent comprises a blend of 2,3 dimethyl-1,4 pentadiene and vinyl pyridine.” The Examiner has relied on Abraham as teaching 2,3 dimethyl-1,4 pentadiene and Denton as teaching vinyl pyridine. However, the claims require a blend of those

two compounds. None of the cited prior art teaches such a combination. Nor do any of the cited prior art provide a clear motivation or any fairly based reason to make the specific combination that is claimed. As such, Applicants respectfully request that the cited combination or references fails to render the claims obvious.

Regarding claim 13, it has been rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949 in combination with Kubota et al. 5,654,114. Claim 28 relates to the limitation of claim 13 and state that “the degassing agent comprises a blend of 1,5 hexadiene and piperazine.” Again, the Examiner has cited two references with each one teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation or any fairly based reason to combine such compounds. As such, Applicants respectfully request that the cited combination fails to render the claim obvious.

Applicants now turn to the rejection of claim 14 under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Japanese publication JP 10-270082 (heretofore the JP’ 082). Claim 29, which substantially includes the same limitation as claim 14, require that “the degassing agent comprises a blend of 2,3 dimethyl-1,3 butadiene and styrene.” Again, the Examiner has cited two references each teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation nor fairly based reason to combine such compounds. In addition, as stated previously, Lucas fails to teach the claimed 2,3 dimethyl-1,3 butadiene as an electrolyte component, but rather describes its use as a monomer in an electrolytic polymerization reaction. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Japanese publication JP 10-040928 (heretofore the JP’ 928) Claims \_\_, which relate to the limitation of claim 14, state “the degassing agent comprises a blend



of 2,3 dimethyl-1,3 butadiene and piperidine.” Again, the Examiner has cited two references each teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation nor fairly based reason to combine such compounds. In addition, as stated previously, Lucas fails to teach the claimed 2,3 dimethyl-1,3 butadiene as an electrolyte component, but rather describes its use as a monomer in an electrolytic polymerization reaction. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.

Applicants now turn to the rejection of claim 16 under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Besenhard et al. 6,942,949 in combination with Denton, III 5,962,168. Although claim 16 has been canceled, claim 31 substantially reflects the same limitation, namely “the degassing agent comprises a blend of hexadiene and vinyl pyridine.” Again, the Examiner has cited two references each teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation nor fairly based reason to combine such compounds. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.

Regarding the claim 18, it has been rejected under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Lucas et al. 3,567,601 in combination with Denton, III 5,962,168. Claim 33 relate to the limitation of claim 18, requiring that “the degassing agent comprises a blend of 2,3 dimethyl-1,3 butadiene and vinyl pyridine.” Again, the Examiner has cited two references each teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation nor fairly based reason to combine such compounds. In addition, as stated previously, Lucas fails to teach the claimed 2,3 dimethyl-1,3 butadiene as an electrolyte component, but rather describes its use as a monomer in an electrolytic polymerization reaction. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.

Applicants lastly turn to the rejection of claim 20 under 35 U.S.C. 103(a) as being unpatentable over Hall 5,993,993 as evidenced by Smith et al. 6,245,461 as applied to claim 1 above, and further in view of Sato et al. 2004/0001302 in combination with Yano et al. 6,507,378. Although claim 20 had been canceled, the limitations of claim 20 are reflected in claim 34, specifically that “the degassing agent comprises a blend of styrene carbonate and vinyl piperazine.” Again, the Examiner has cited two references each teaching one part of the combination, but neither teaches the claimed combination nor provides any motivation nor fairly based reason to combine such compounds. As such, Applicants respectfully request that the cited combination fails to render the claims obvious.


Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1450. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1450. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1450.

Respectfully submitted,

Date Dec 19, 2006

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